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EXAMINER
SURYAWANSHI, SURESH

ART UNIT	PAPER NUMBER
2115	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/26/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

PTOL-90A (Rev. 10/06)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>04 October 2006</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

DETAILED ACTION

1.   Claims 1-30 are presented for examination.

2.   The text of those sections of Title 35 U.S. Code not include in this action can be found in

the prior office action.

3.   Claims 1-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Duffield et al

(US Patent 6,452,933; hereinafter Duffield).

4.   As per claim 1, Duffield discloses

        determining available slack [col. 2, lines 33-35, 51-59; col. 3, lines 13-17, 30-33; col. 4,

lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; unused bandwidth]; and

        allocating slack to tasks in different time partitions [col. 2, lines 33-35, 51-59; col. 3,

lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; means for

redistributing excess bandwidth].

5.   As per claim 5, Duffield discloses

        scheduling tasks to execute in different time partitions [col. 2, lines 3-35, 51-59; col. 3,

lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; scheduling means];

        determining available slack [col. 2, lines 3-35, 51-59; col. 3, lines 13-17, 30-33; col. 4,

lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; unused bandwidth]; and

        allocating slack to tasks in different time partitions [col. 2, lines 3-35, 51-59; col. 3,

lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; means for

redistributing excess bandwidth].

6.   As per claim 6, Duffield discloses

        collecting unscheduled execution time from at least one time partition [col. 2, lines 3-35,

51-59; col. 3, lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; unused

bandwidth]; and

        allocating the unscheduled execution time to a task in another partition [col. 2, lines 3-

35, 51-59; col. 3, lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10;

means for redistributing excess bandwidth].

7.   As per claim 10, Duffield discloses

        determining available slack [col. 2, lines 3-35, 51-59; col. 3, lines 13-17, 30-33; col. 4,

lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; unused bandwidth];

        pooling available slack in a common slack pool [col. 2, lines 3-35, 51-59; col. 3,

lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; unused bandwidth];

and

        allocating slack from the common slack pool to tasks [col. 2, lines 3-35, 51-59; col. 3,

lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; means for

redistributing excess bandwidth].

8.   As per claim 11, Duffield discloses

        determining available slack [col. 2, lines 3-35, 51-59; col. 3, lines 13-17, 30-33; col. 4,

lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; unused bandwidth];

        pooling available slack in a common slack pool [col. 2, lines 3-35, 51-59; col. 3,

lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; unused bandwidth];

and

allocating slack from the common slack pool to tasks [col. 2, lines 3-35, 51-59; col. 3,

lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; means for

redistributing excess bandwidth].

9.   As per claim 14, Duffield discloses

scheduling tasks to execute in different time partitions [col. 2, lines 3-35, 51-59; col. 3,

lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; scheduling means];

determining available slack [col. 2, lines 3-35, 51-59; col. 3, lines 13-17, 30-33; col. 4,

lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; unused bandwidth];

pooling available slack in a common slack pool [col. 2, lines 3-35, 51-59; col. 3,

lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; unused bandwidth];

and

allocating slack from the common slack pool to tasks [col. 2, lines 3-35, 51-59; col. 3,

lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; means for

redistributing excess bandwidth].

10.   As per claim 15, Duffield discloses

determining available timeline slack [col. 2, lines 3-35, 51-59; col. 3, lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; unused bandwidth];

determining available reclaimed slack [col. 2, lines 3-35, 51-59; col. 3, lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; unused bandwidth];

pooling available timeline and reclaimed slack [col. 2, lines 3-35, 51-59; col. 3, lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; unused bandwidth]; and

allocating slack to task in any time partition [col. 2, lines 3-35, 51-59; col. 3, lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; means for redistributing excess bandwidth].

11.   As per claim 18, Duffield discloses

scheduling tasks to execute in different time partition [col. 2, lines 3-35, 51-59; col. 3, lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; scheduling means];

determining available timeline slack [col. 2, lines 3-35, 51-59; col. 3, lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; unused bandwidth];

determining available reclaimed slack [col. 2, lines 3-35, 51-59; col. 3, lines 13-17,

30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; unused bandwidth];

pooling available timeline and reclaimed slack [col. 2, lines 3-35, 51-59; col. 3,

lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; unused bandwidth];

and

allocating slack to a task in any time partition [col. 2, lines 3-35, 51-59; col. 3, lines

13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; means for redistributing

excess bandwidth].

12.   As per claim 19, Duffield discloses

a processor to execute a plurality of tasks [inherent to the system as the system being a

packet-based communication system]; and

an executive to be in communication with the processor [Fig. 2; inherent to the system as

the system being a packet-based communication system], wherein the executive

comprises:

a first module that is to determine available slack [col. 2, lines 3-35, 51-59; col. 3,

lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; unused bandwidth];

and

a second module that is to allocate available slack [col. 2, lines 3-35, 51-59; col. 3,

lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; means for

redistributing excess bandwidth].

13.   As per claims 2, 7, 12 and 16, Duffield discloses the task that are allocated slack are

aperiodic, non-essential tasks [col. 2, lines 33-35, 51-59; col. 3, lines 13-17, 30-33; col. 4, lines

6-8, 18-23; col. 5, line 55 -- col. 6, line 10].

14.   As per claims 3, 8, 13 and 17, Duffield discloses that the tasks comprise essential and

non-essential tasks [col. 2, lines 3-35, 51-59; col. 3, lines 13-17, 30-33; col. 4, lines 6-8, 18-23;

col. 5, line 55 -- col. 6, line 10].

15.   As per claims 4 and 14, Duffield discloses wherein in determining, both timeline slack

and reclaimed slack are determined [col. 2, lines 3-35, 51-59; col. 3, lines 13-17, 30-33; col. 4,

lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10].

16.   As per claim 9, Duffield discloses wherein in collecting unscheduled execution time, both

timeline slack and reclaimed slack are colleted [col. 2, lines 3-35, 51-59; col. 3, lines 13-17, 30-

33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10].

17.   As per claim 21, Duffield discloses wherein the first module is to maintain a pool of

available slack [col. 2, lines 3-35, 51-59; col. 3, lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col.

5, line 55 -- col. 6, line 10; unused bandwidth].

18.   As per claim 22, Duffield discloses wherein the first module is to maintain a common

pool of available slack that can be used by tasks in any time partition [col. 2, lines 3-35, 51-59;

col. 3, lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; unused

bandwidth].

19.   As per claim 23, Duffield discloses wherein the second module is to allocate available

slack to tasks that are non-essential [col. 2, lines 3-35, 51-59; col. 3, lines 13-17, 30-33; col. 4,

lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10; means for redistributing excess bandwidth].

20.   As per claim 24, Duffield discloses wherein the tasks are from the group consisting of

new non-essential tasks and enhancements to essential tasks [col. 2, lines 3-35, 51-59; col. 3,

lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10].

21.   As per claim 25, Duffield discloses wherein the executive further comprises a third

module that is to assign different priority levels to tasks [Fig. 1; col. 2, lines 3-35, 51-59; col. 3,

lines 13-17, 30-33; col. 4, lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10].

22.   As per claim 26, Duffield discloses wherein the first module is to determine available

tasks at each priority level [Fig. 1; col. 2, lines 3-35, 51-59; col. 3, lines 13-17, 30-33; col. 4,

lines 6-8, 18-23; col. 5, line 55 -- col. 6, line 10].

23.   As per claim 27, Duffield discloses wherein the second module is to allocate available

slack to tasks in order of priority [col. 2, lines 3-35, 51-59; col. 3, lines 13-17, 30-33; col. 4, lines

6-8, 18-23; col. 5, line 55 -- col. 6, line 10; means for redistributing excess bandwidth].

24.   As per claims 28 and 29, Duffield discloses wherein the system is a flight control, real-

time control system [inherent to the system as the invention relates to packet-based

communication systems].

25.   As per claim 30, Duffield discloses wherein the executive comprises a single set of slack

variables and a single slack table [col. 4, line 63 -- col. 5, line 3; col. 5, lines 28-34].

Response to Arguments

26.   Applicants' arguments filed 10/04/06 have been fully considered but are not persuasive.

27.   Applicant argues in substance that Duffield does not teach a system having different time

partitions. The examiner respectfully traverses applicant's position. Duffield indeed teaches a

scheduling system having different time partitions. Specifically, in a system having 3 queues,

Q1, Q2, and Q3, Duffield allocates 20%, 30%, and 50% of the bandwidth to the three different

queues respectively [col. 2, lines 22 – 27]. In other words, each of the queues is assigned a time

partition of certain duration. The system has 3 time partitions – first partition has .2 second,

second partition has .3 second, and third partition has .5 second. Duffield further teaches the

determining of available slack [unused bandwidth in a partition, col. 5,lines 65 - 67] and

allocating the slack to tasks in different time partitions [redistributing the unused bandwidth to

different time partitions, col. 6, lines 1 - 7].

Conclusion

28.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

        Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Suresh K. Suryawanshi whose telephone number is 571-272-

3668. The examiner can normally be reached on 9:00am - 5:30pm.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Thomas C. Lee can be reached on 571-272-3667. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

        Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

sks
December 19, 2006

CHUN CAO
PRIMARY EXAMINER